EMERSON
Network Power

ATCA-7350 Control via IPMI

Programmer's Reference

6806800H29E

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About this Manual

Overview of Contents

This manual is intended for users qualified in electronics or electrical engineering. Users must have a working understanding of Intelligent Platform Management Interface (IPMI).

It provides information on how to control and monitor the functionality of the ATCA-7350 via IPMI and contains the following chapters and appendices:

- Chapter 1, *Introduction,* on page 11 describes the main features of the IPMC firmware.
- Chapter 2, *Supported Commands,* on page 15 lists all the IPMI1.5 and IPMI2.0 standard commands supported by the ATCA-7350.
- Chapter 3, *FRU Information and Sensor Data Records, on page 27* provides the FRU information and all the sensor data records.
- Chapter 4, *SOL Module Configuration, on page 53* describes how to configure the Serial over LAN.
- Appendix A, *Related Documentation, on page 59* provides links to further ATCA-7350-related documentation.

Abbreviations

This document uses the following abbreviations:

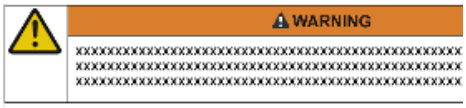
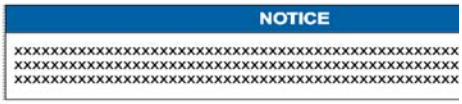
Abbreviation	Definition
ACPI	Advanced Configuration and Power Interface
ATCA	Advanced Telecom Computing Architecture
BIOS	Basic Input/Output System
CMD	IPMI Command Specified in Hexadecimal
CPU	Central Processing Unit
FBD	Fully Buffered DIMM
FPGA	Field-Programmable Gate Array
FRU	Field Replaceable Unit
FW	Firmware
GA	General Availability
GUID	Global Unique Identifier
HD	Hard Disk
IANA	Internet Assigned Numbers Authority
IPMB	Intelligent Platform Management Bus

Abbreviation	Definition
IPMC	Intelligent Platform Management Controller
IPMI	Intelligent Platform Management Interface
LAN	Local Area Network
LED	Light Emitting Diode
LSB	Least Significant Bit
LUN	Logical Units
MAC	Media Access Control
MSB	Most Significant Bit
NetFn	IPMI Network Function in Hexadecimal
OEM	Original Equipment Manufacturer
PICMG	PCI Industrial Computer Manufacturers Group
PwrOk	Power OK
RTM	Rear-Transition Modules
SDR	Sensor Data Records
SEL	System Event Log
SOL	Serial Over LAN
VCC	Virtual Channel Connection
VER	Version

Conventions

The following table describes the conventions used throughout this manual.

Notation	Description
0x00000000	Typical notation for hexadecimal numbers (digits are 0 through F), for example used for addresses and offsets
0b0000	Same for binary numbers (digits are 0 and 1)
bold	Used to emphasize a word
`Screen`	Used for on-screen output and code related elements or commands in body text
`Courier + Bold`	Used to characterize user input and to separate it from system output
Reference	Used for references and for table and figure descriptions
File > Exit	Notation for selecting a submenu
<text>	Notation for variables and keys
[text]	Notation for software buttons to click on the screen and parameter description
...	Repeated item for example node 1, node 2, ..., node 12

Notation	Description
. . .	Omission of information from example/command that is not necessary at the time being
..	Ranges, for example: 0..4 means one of the integers 0,1,2,3, and 4 (used in registers)
|	Logical OR
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
	Indicates a property damage message
	No danger encountered. Pay attention to important information

Summary of Changes

This manual has been revised and replaces all prior editions.

Part Number	Publication Date	Description
6806800H29A	December 2008	First edition
6806800H29B	January 2009	Second edition
6806800H29C	January 2009	Third edition
6806800H29D	February 2009	Fourth edition
6806800H29E	August 2011	Added Table 3-30 on page 47 and Table 3-31 on page 48.

Comments and Suggestions

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In "Area of Interest" select "Technical Documentation". Be sure to include the title, part number, and revision of the manual and tell us how you used it.

Introduction

1

1.1 Overview

The ATCA-7350 provides an intelligent hardware management system as defined in the AdvancedTCA Base Specification (PICMG 3.0; AMC.0). This system implements an Intelligent Peripheral Management Controller (IPMC) based on the proprietary H8S reference design from American Megatrends Inc.

The ATCA-7350 IPMC supports all standard Intelligent Peripheral Management Interface (IPMI) commands and provides hardware interfaces for other system managements features such as hot-swap control, LED control, power control and temperature and voltage monitoring. The IPMC also supports a Keyboard Controller Style (KCS) based host interface for payload-to-IPMI communication.

In addition, the following features are included:

Table 1-1 Features

Feature	Further Details...
Supported for fault tolerant field upgrade Support for field updates of firmware via the payload processor interface	*IPMC Firmware Upgrade* on page 12
Serial over LAN (SOL)	*Serial over LAN* on page 13
Sensor management including, among others, power good and boot bank supervision sensor	*Sensors* on page 13
FRU inventory with MAC address record	*MAC Address Record* on page 13
Asynchronous event notification	*Asynchronous Event Notification* on page 13
Graceful shutdown timeout	*Graceful Shutdown Timeout* on page 13
Local system event log (SEL)	*Local System Event Log* on page 14
External watchdog	*External Watchdog* on page 14
BIOS boot configuration via IPMI	*Boot Configuration Parameters* on page 14 *Chassis Device Commands* on page 18

1.2 Feature Description

Besides its basic functions, the ATCA-7350 provides the features described in this section.

1.2.1 HPM.1 Specific Firmware Upgrades

1.2.1.1 IPMC Firmware Upgrade

The IPMC firmware basically consists of five major parts:

- Boot loader
- Active and Backup IPMI firmware
- Active and Backup SDR data

The boot loader maintains redundant copies of the firmware in the flash memory of the ATCA-7350. Each time the IPMC firmware is upgraded, the most recent firmware version is kept in flash memory and the older firmware version is overwritten by the new one. Once the new IPMI firmware is programmed, the IPMC resets itself to boot from the new image. The boot loader validates the new IPMC firmware. Provided the IPMC can power up successfully the current image is made active and the previously active image is made backup. In case of power-up failures, the boot loader automatically recovers from crisis and boots from the previous image.

The IPMC can be upgraded via KCS and IPMB interface. To ensure that the payload is not interrupted during IPMC firmware upgrade, the IPMC is storing all operational information (E-keying, SOL parameters, hot-swap state, last events to be queued, graceful shutdown timeout, latest pin settings…) in non-volatile storage.

The IPMC firmware is fully HPM.1 compliant. Thus in general also open source tools like ipmitool can be used for IPMC firmware upgrade. However, we recommend to use the firmware upgrade tools provided by Emerson (fcu, fuf, or ipmi_upd.sh). To obtain these tools contact your local sales representative.

The SDR data is hold as a separate component which can be upgraded separately. The IPMC holds an active and a backup component.

1.2.1.2 BIOS Upgrade

BIOS can either be upgraded via flash based tools provided from Emerson, or via IPMI with the use of HPM.1 specific protocols. The BIOS firmware is fully implemented as HPM.1 specific components with an active and an backup image. BIOS upgrade via IPMI is intended to be used for crisis recovery only. This is because it is much more time consuming than using flash based routines. Be aware that even when no BIOS boot bank is programmed at all (no boot loader) crisis recovery via IPMI is always possible.

1.2.1.3 FPGA Upgrade

The FPGA can be upgraded via IPMI also. The IPMC controls an active component and a backup component for crisis recovery.

1.2.2 Serial over LAN

Serial over LAN (SOL) is an IPMI v.2.0 defined capability that allows to establish a virtual serial console connection with the payload over LAN. The serial data of the payload is transferred to the IPMC. The IPMC generates RMCP+ packets, which are routed to the ethernet controller of the base interfaces. Be aware that SOL/LAN configuration is only possible if the Ethernet controller and its payload is fully powered, otherwise the completion code 0xD5 is returned. For more information on how to use and configure SOL see Chapter 4, *SOL Module Configuration,* on page 53.

1.2.3 Sensors

Apart from several voltage and temperature specific sensors (for details refer to *Sensor Data Records* on page 29), the IPMC provides the following additional sensors:

Table 1-2 Sensors

Sensor	Description
Firmware Progress, and Boot Error Sensor	The IPMC firmware provides Firmware Progress (Table 3-24 on page 43), and Boot Error (Table 3-16 on page 37) sensors to enable payload firmware and payload OS to report boot progress and OS Boot via IPMI event messages.

1.2.4 MAC Address Record

The ATCA-7350 implements an MAC address FRU OEM record. You can retrieve all MAC addresses of the blade from the FRU information. For more details refer to *MAC Address Record* on page 27.

1.2.5 Asynchronous Event Notification

To enable payload applications to be informed about graceful shutdown/reboot requests, the FRU Activate (Deactivate) and FRU Control (Graceful Reboot) command message is routed as a LUN2 message to the payload interface.

If the payload application has registered to these commands via the OpenIPMI library, it gets informed and can take all necessary actions before the payload is gracefully rebooted or shut-down.

1.2.6 Graceful Shutdown Timeout

The IPMI command Set System Boot Options together with the parameter #98 can be used to persistently specify the timeout for Graceful Shutdown. For more information refer to *Chassis Device Commands* on page 18.

1.2.7 Local System Event Log

The IPMC provides a local system event log (SEL). Thus, event information is stored on-board the ATCA-7350 as well.

1.2.8 External Watchdog

For crisis recovery purposes the IPMI building block provides an external hardware watchdog. The IPMI firmware is reset if it does not trigger the watchdog anymore.

1.2.9 Boot Configuration Parameters

The IPMC supports BIOS boot order selection via IPMI partially. Be aware, that in case of the BIOS boot order is selected via IPMI the boot order displayed in the BIOS menu doesn't reflect the boot order selected via IPMI. For more information how to set the boot order via IPMI refer to System Boot Option Commands, parameter #5.

Supported Commands

2

2.1 Standard IPMI Commands

The IPMC is fully compliant to the Intelligent Platform Management Interface v.1.5. This section provides information about the supported IPMI commands.

2.1.1 Global IPMI Commands

The IPMC supports the following global IPMI commands.

Table 2-1 Supported Global IPMI Commands

Command	NetFn (Request/Response)	CMD	Comments
Get Device ID	0x06/0x07	0x01	-
Cold Reset	0x06/0x07	0x02	-
Warm Reset	0x06/0x07	0x03	-
Get Self Test Results	0x06/0x07	0x04	-
Get Device GUID	0x06/0x07	0x08	-

2.1.2 System Interface Commands

The system interface commands are supported by blades providing a system interface.

Table 2-2 Supported System Interface Commands

Command	NetFn (Request/Response)	CMD
Set BMC Global Enables	0x06/0x07	0x2E
Get BMC Global Enables	0x06/0x07	0x2F
Clear Message Flags	0x06/0x07	0x30
Get Message Flags	0x06/0x07	0x31
Get Message	0x06/0x07	0x33
Send Message	0x06/0x07	0x34
Set Channel Access	0x06/0x07	0x40
Get Channel Access	0x06/0x07	0x41
Get Channel Info	0x06/0x07	0x42
Set User Access	0x06/0x07	0x43
Get User Access	0x06/0x07	0x44
Set User Name	0x06/0x07	0x45

Table 2-2 Supported System Interface Commands (continued)

Command	NetFn (Request/Response)	CMD
Get User Name	0x06/0x07	0x46
Set User Password	0x06/0x07	0x47
Set User Payload Access	0x06/0x07	0x4C
Get User Payload Access	0x06/0x07	0x4D
Set Channel Security Keys	0x06/0x07	0x5C

2.1.3 Watchdog Commands

The watchdog commands are supported by blades providing a system interface and a watchdog type 2 sensor.

The pre-timeout option is not supported.

Table 2-3 Supported Watchdog Commands

Command	NetFn (Request/Response)	CMD
Reset Watchdog Timer	0x06/0x07	0x22
Set Watchdog Timer	0x06/0x07	0x24
Get Watchdog Timer	0x06/0x07	0x25

2.1.4 SEL Device Commands

Table 2-4 Supported SEL Device Commands

Command	NetFn (Request/Response)	CMD
Get SEL Info	0x0A/0x0B	0x40
Reserve SEL	0x0A/0x0B	0x42
Get SEL Entry	0x0A/0x0B	0x43
Add SEL Entry	0x0A/0x0B	0x44
Clear SEL	0x0A/0x0B	0x47
Get SEL Time	0x0A/0x0B	0x48
Set SEL Time	0x0A/0x0B	0x49

2.1.5 FRU Inventory Commands

Table 2-5 Supported FRU Inventory Commands

Command	NetFn (Request/Response)	CMD
Get FRU Inventory Area Info	0x0A/0x0B	0x10
Read FRU Data	0x0A/0x0B	0x11
Write FRU Data	0x0A/0x0B	0x12

2.1.6 Sensor Device Commands

Table 2-6 Supported Sensor Device Commands

Command	NetFn (Request/Response)	CMD	Comments
Get Device SDR Info	0x04/0x05	0x20	-
Get Device SDR	0x04/0x05	0x21	-
Reserve Device SDR Repository	0x04/0x05	0x22	-
Get Sensor Reading Factors	0x04/0x05	0x23	-
Set Sensor Hysteresis	0x04/0x05	0x24	-
Get Sensor Hysteresis	0x04/0x05	0x25	-
Set Sensor Threshold	0x04/0x05	0x26	-
Get Sensor Threshold	0x04/0x05	0x27	-
Set Sensor Event Enable	0x04/0x05	0x28	-
Get Sensor Event Enable	0x04/0x05	0x29	-
Get Sensor Event Status	0x04/0x05	0x2B	-
Get Sensor Reading	0x04/0x05	0x2D	-
Get Sensor Type	0x04/0x05	0x2F	-
Set Event Receiver	0x04/0x05	0x00	-
Get Event Receiver	0x04/0x05	0x01	-
Platform Event	0x04/0x05	0x02	-

2.1.7 Chassis Device Commands

Table 2-7 Supported Chassis Device Commands

Command	NetFn (Request/Response)	CMD
Set System Boot Options	0x00/0x01	0x08
Get System Boot Options	0x00/0x01	0x09

2.1.7.1 System Boot Options Commands

The IPMI system boot options commands allow you to control the boot process of a blade by sending boot parameters to the blade's boot firmware (for example BIOS, U-Boot or VxWorks). The boot firmware interprets the sent boot parameters and executes the boot process accordingly. Each boot parameter addresses a particular functionality and consists of a sequence of one or more bytes. The IPMI specification assigns numbers to boot parameters. Boot parameters 0 to 7 are standard parameters whose structure and functionality is defined by the IPMI specification. The boot parameters 96 to 127 are OEM-specific which can be used for different purposes.

The following table lists which boot properties can be configured and the corresponding boot parameter number.

Table 2-8 Configurable System Boot Option Parameters

Configurable Boot Property	Corresponding Boot Parameter Number
Boot flags	5
Selection between default and backup boot flash as device to boot from Selection between default and backup EEPROM as device where the on-board FPGA loads its configuration stream from	96
Timeout for graceful shutdown	98
Write Protection for BIOS boot banks and FRU information	99

2.1.7.1.1 System Boot Options Parameter #5

This boot parameter is implemented as specified within the IPMI specification, but not all flags are supported.

Table 2-9 System Boot Options Parameter #5

Data Byte	Description
1	[7] - 1b = boot flags valid. The bit should be set to indicate that valid flag data is present. This bit may be automatically cleared based on the boot flag valid bit clearing parameter, above. [6] - Not supported. [5] - Not supported [4:0] - reserved
2	[7] - 1b = CMOS clear [6] - Not supported [5:2] - Boot device selector 0000b = No override 0001b = Force PXE 0010b = Force boot from default Hard-drive 0011b = Not supported 0100b = Not supported 0101b = Force boot from default CD/DVD 0110b = Not supported 0111b-1110b = Reserved 1111b = Force boot from Floppy/primary removable media [1] - 1b = Not supported [0] - 1b = Not supported
3	Not supported
4	Not supported
5	Reserved

2.1.7.1.2 System Boot Options Parameter #96

This boot parameter is an Emerson-specific OEM boot parameter. Its definition is given in the following table.

Table 2-10 System Boot Options Parameter #96

Boot Option Parameter Data	Description
1	This parameter specifies the processor ID for which the boot option is to be set. This parameter has to be 0 always for this blade.
2	This parameter is used to select the BIOS boot bank of which the payload shall boot from: [7:1] Reserved [0] Default/backup boot flash selection

There is no Set Selector or Block Selector with this command.

The System Boot Options parameter #96 is non-volatile. Its parameter data remains preserved after IPMC power cycles and firmware upgrades.

2.1.7.1.3 System Boot Options Parameter #98

This boot parameter is an Emerson-specific OEM parameter.

This timer specifies how long the IPMC waits for the payload to shut down gracefully. If the payload software does not configure its OpenIPMI library to be notified for graceful shutdown requests, the IPMC shuts down the payload when the timer expires.

Table 2-11 System Boot Options Parameter #98

Boot Option Parameter Data	Description
1	This parameter specifies the Graceful Shutdown Timeout LSB (given in 100 msec)
2	This parameter specifies the Graceful Shutdown Timeout MSB (given in 100 msec)

There is no Set Selector or Block Selector with this command.

The System Boot Options parameter #98 is non-volatile. Its parameter data remains preserved after IPMC power cycles and firmware upgrades.

2.1.7.1.4 System Boot Options #99

This parameter is an Emerson-specific OEM parameter. It is used to enable or disable BIOS and FRU write protection

Table 2-12 System Boot Options Parameter #99

Boot Option Parameter Data	Description
1	This parameter enables/disables BIOS and FRU write protection: [7:4] Bios ID (0= Boot Bank A, 1= Boot Bank B, 2= FRU information, others reserved) [3:0] write protect enable/disable (0= disable, 1= enable, others reserved)

There is no Set Selector or Block Selector with this command. The Boot Option parameter data returned with the IPMI command Get System Boot Options provides the write protect status of the two BIOS flashes and of the FRU information (one byte for each instance).

2.1.8 LAN Device Commands

Table 2-13 Supported LAN Device Commands

Command	NetFn (Request/Response)	CMD
Set LAN Configuration Parameters	0x0C/0x0D	0x01
Get LAN Configuration Parameters	0x0C/0x0D	0x02
Set SOL Configuration Parameters	0x0C/0x0D	0x21
Get SOL Configuration Parameters	0x0C/0x0D	0x22

2.2 PICMG 3.0 Commands

The Emerson IPMC is a fully compliant AdvancedTCA intelligent Platform Management Controller i.e. it supports all required and mandatory AdvancedTCA commands as defined in the PICMG 3.0 specifications.

Table 2-14 Supported PICMG 3.0 Commands

Command	NetFn (Request/Response)	CMD	Comments
Get PICMG Properties	0x2C/0x2D	0x00	-
Get Address Info	0x2C/0x2D	0x01	-
FRU Control	0x2C/0x2D	0x04	-
Get FRU LED Properties	0x2C/0x2D	0x05	-
Get FRU LED Color Capabilities	0x2C/0x2D	0x06	-
Set FRU LED State	0x2C/0x2D	0x07	-
Get FRU LED State	0x2C/0x2D	0x08	-
Set IPMB State	0x2C/0x2D	0x09	-
Set FRU Activation Policy	0x2C/0x2D	0x0A	-
Get FRU Activation Policy	0x2C/0x2D	0x0B	-
Set FRU Activation	0x2C/0x2D	0x0C	-
Get Device Locator Record ID	0x2C/0x2D	0x0D	-
Set Port State	0x2C/0x2D	0x0E	-
Get Port State	0x2C/0x2D	0x0F	-
Compute Power Properties	0x2C/0x2D	0x10	-
Set Power Level	0x2C/0x2D	0x11	-
Get Power Level	0x2C/0x2D	0x12	-
Get IPMB Link Info	0x2C/0x2D	0x18	-
Set AMC Port State	0x2C/0x2D	0x19	-
Get AMC Port State	0x2C/0x2D	0x1A	-
Get FRU Control Capabilities	0x2C/0x2D	0x1E	-
Get target upgrade capabilities	0x2C/0x2D	0x2E	-
Get component properties	0x2C/0x2D	0x2F	-
Abort firmware upgrade	0x2C/0x2D	0x30	-
Initiate upgrade action	0x2C/0x2D	0x31	-
Upload firmware block	0x2C/0x2D	0x32	-
Finish firmware upload	0x2C/0x2D	0x33	-
Get upgrade status	0x2C/0x2D	0x34	-

Table 2-14 Supported PICMG 3.0 Commands (continued)

Command	NetFn (Request/Response)	CMD	Comments
Activate firmware	0x2C/0x2D	0x35	-
Query self-test results	0x2C/0x2D	0x36	-
Query rollback status	0x2C/0x2D	0x37	-
Initiate manual rollback	0x2C/0x2D	0x38	-

The firmware upgrade commands supported by the ATCA-7350 are implemented according to the PICMG HPM.1 Revision 1.0 specification.

2.3 Emerson Specific Commands

The Emerson IPMC supports several commands which are not defined in the IPMI or PICMG 3.0 specification but are introduced by Emerson: serial output commands.

- **Before sending any of these commands, the shelf management software must check whether the receiving IPMI controller supports Emerson specific IPMI commands, by using the IPMI command 'Get Device ID'. Sending Emerson specific commands to IPMI controllers which do not support these IPMI commands will lead to no or undefined results.**
- **Implementing any of the Emerson specific IPMI commands means that the software is not portable to other IPMI controllers that do not use the IPMC firmware.**

2.3.1 Serial Output Commands

Table 2-15 Serial Output Commands

Command Name	NetFn (Request/Response)	CMD	Description
Set Serial Output	0x2E/0x2F	0x15	See *Set Serial Output Command* on page 24
Get Serial Output	0x2E/0x2F	0x16	See *Get Serial Output Command* on page 24

2.3.1.1 Set Serial Output Command

The Set Serial Output command selects the serial port output source for a serial port connector.

2.3.1.1.1 Request Data

The following table lists the request data applicable to the Set Serial Output command.

Table 2-16 Request Data of Set Serial Output Command

Byte	Data Field
1	LSB of Emerson IANA Enterprise number. A value of 0xCD has to be used.
2	Second byte of Emerson IANA Enterprise number. A value of 0x65 has to be used.
3	MSB of Emerson IANA Enterprise number. A value of 0x00 has to be used.
4	Serial connector type 0: Face plate connector All other values are reserved.
5	Serial connector instance number. A sequential number that starts from 0.
6	Serial output selector 0: payload serial console (default 9600 baud) 2: IPMC(default baud rate 115200 baud) All other values are reserved.

2.3.1.1.2 Response Data

The following table lists the response data applicable to the Set Serial Output command.

Table 2-17 Response Data of Set Serial Output Command

Byte	Data Field
1	Completion code
2	LSB of Emerson IANA Enterprise number.
3	Second byte of Emerson IANA Enterprise number.
4	MSB of Emerson IANA Enterprise number.

2.3.1.2 Get Serial Output Command

The Get Serial Output Command provides a way to determine which serial output source goes to a particular serial port connector.

2.3.1.2.1 Request Data

The following table lists the request data applicable to the Get Serial Output command.

Table 2-18 Request Data of Get Serial Output Command

Byte	Data Field
1	LSB of Emerson IANA Enterprise number. A value of 0xCD has to be used.
2	Second byte of Emerson IANA Enterprise number. A value of 0x65 has to be used.
3	MSB of Emerson IANA Enterprise number. A value of 0x00 has to be used.
4	Serial connector type 0: Face plate connector All other values are reserved.
5	Serial connector instance number. A sequential number that starts from 0.

2.3.1.2.2 Response Data

The following table lists the response data applicable to the Get Serial Output command.

Table 2-19 Response Data of Get Serial Output Command

Byte	Data Field
1	Completion code
2	LSB of Emerson IANA Enterprise number.
3	Second byte of Emerson IANA Enterprise number.
4	MSB of Emerson IANA Enterprise number.
5	Serial output selector

FRU Information and Sensor Data Records

3

3.1 FRU Information

The ATCA-7350 supports FRU according to the PICMG 3.0 ATCA specification. The ATCA-7350 supports six FRUs, including:

- FRU0: on the ATCA-7350
- FRU1: RTM-ATCA-7350
- FRU2-FRU3: for daughter cards on the RTM-ATCA-7350
- FRU6: SOL daughter card on the ATCA-7350

FRU0 and FRU1 are managed FRUs, whereas other FRUs are unmanaged ones.

Table 3-1 shows the FRU data format of RU0-FRU6.

Table 3-1 FRU Information

Area	Description	Value	Access
Board info area	Manufacturing date/time	According to Platform Management FRU information Storage Definition v1.0	r/w
	Board manufacturer	EMERSON	r/w
	Board product name	ATCA-7350	r/w
	Board serial number	Defined by Emerson	r/w
	Board part number	Defined by Emerson	r/w
Product info area	Product manufacturer	EMERSON	r/w
	Product name	Specific blade variant name	r/w
	Product serial number	Defined by Emerson	r/w
	Product Version	Defined by Emerson	r/w
	Product part number	Defined by Emerson	r/w
Multi record area	OEM MAC address record	Emerson record ID 0x01	r/w
	Board point-to-point connectivity record	PICMG record ID 0x14	r/w

3.2 MAC Address Record

The blade provides one OEM FRU record which contains information about on-board MAC

addresses. The format of the record is described in the following tables.

Table 3-2 Emerson MAC Address Record

Offset	Length	Description
0	1	Record Type ID. A value of 0xC0
1	1	End of List/Version [7] End of List. Set to 01b for the last record [6:4] Reserved. Write as 0b0000. [3:0] Record format version. Write as 0x2.
2	1	Record Length
3	1	Record Checksum. Holds the zero checksum of the record
4	1	Header Checksum. Holds the zero checksum of the header.
5	1	LSB of Manufacturer ID. Value is 0xCD
6	1	Second Byte of Manufacturer ID. Value is 0x65
7	1	MSB of Manufacturer ID. Value is 0x00
8	1	Emerson Record ID. Value is 0x01
9	1	Record Format Version. Value is: 0x00
10	1	Number of MAC Address Descriptors (N).
11	N*7	Emerson MAC Address Descriptors Refer to Table 3-3 on page 28 for definitions of the Emerson MAC Address Descriptor.

Table 3-3 Emerson MAC Address Descriptor

Offset	Length	Description
0	1	Interface type Refer to Table 3-4 on page 28 for interface type assignments.
1	6	MAC Address. First octet comes first.

Table 3-4 Interface Type Assignments

Interface Type	Description
0x01	AdvancedTCA base interface or AMC/MicroTCA common options region
0x02	AdvancedTCA fabric interface or AMC/MicroTCA fat pipe region
0x03	Face plate
0x04	AMC/MicroTCA extended fat pipe region

3.3 Sensor Data Records

The sensors available on the ATCA-7350 are shown in the table below.

Table 3-5 IPMI Sensors Overview

Sensor Name	Sensor Type	Sensor Number	Detailed SDR Description
+12VCC	Voltage	0x07	See Table 3-6 on page 30
+3.3VCC	Voltage	0x05	See Table 3-7 on page 30
+3.3VSB	Voltage	0x09	See Table 3-8 on page 31
+5VCC	Voltage	0x08	See Table 3-9 on page 32
+5VSB	Voltage	0x06	See Table 3-10 on page 33
-48V Power1	Power Supply	0x0C	See Table 3-11 on page 34
-48V Power2	Power Supply	0x0D	See Table 3-12 on page 34
ACPI State	System ACPI Power State	0x16	See Table 3-13 on page 35
BIOS Bank	Emerson-specific Discrete Digital	0x19	See Table 3-14 on page 36
BMC POST ERROR	Management Subsystem Health	0x1A	See Table 3-15 on page 36
Boot Errors	Boot Error	0x10	See Table 3-16 on page 37
CPU0 Core Rem	Temperature	0x13	See Table 3-17 on page 38
CPU0 Status	Processor	0x0E	See Table 3-18 on page 39
CPU1 Core Rem	Temperature	0x14	See Table 3-19 on page 39
CPU1 Status	Processor	0x0F	See Table 3-20 on page 40
CPU Inlet Temp	Temperature	0x01	See Table 3-21 on page 41
FBD Inlet Temp	Temperature	0x02	See Table 3-22 on page 42
FRU Hot Swap	PICMG 3.0: FRU HotSwap	0x0A	See Table 3-23 on page 42
FW Progress	System Firmware Progress	0x18	See Table 3-24 on page 43
Handle State	OEM reserved	0x11	See Table 3-25 on page 44
HD Env Temp	Temperature	0x03	See Table 3-26 on page 44
IPMB Link State	PICMG 3.0: IPMB Physical Link	0x0B	See Table 3-27 on page 45
Log Disabled	Event Logging Disabled	0x15	See Table 3-28 on page 46
PwrOk Sig. Drop	Power Supply	0x12	See Table 3-29 on page 47
RTM Handle	OEM reserved	0x30	See Table 3-30 on page 47
RTM HS	PICMG 3.0: FRU HotSwap	0x31	See Table 3-31 on page 48
SYSTEM RESTART	System Boot Initiated	0x1B	See Table 3-32 on page 49
Ver Change	Version Change	0x1C	See Table 3-33 on page 49
Watchdog	Watchdog 2	0x17	See Table 3-34 on page 50

The following tables describe all on-board IPMI sensors in detail.

Table 3-6 +12VCC Sensor

Feature	Raw Value	Description
Sensor Name	+12VCC	-
Sensor LUN	0x00	-
Sensor Number	0x07	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x02	Voltage
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x04	Volts
Nominal Reading	0xBF	12.03
Upper non-recoverable threshold	0xE9	14.68
Upper critical threshold	0xE0	14.11
Upper non-critical threshold	0xD6	13.48
Lower non-recoverable threshold	0x94	9.32
Lower critical threshold	0x9D	9.89
Lower non-critical threshold	0xA7	10.52
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-7 +3.3VCC Sensor

Feature	Raw Value	Description
Sensor Name	+3.3VCC	-
Sensor LUN	0x00	-
Sensor Number	0x05	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x02	Voltage
Event/Reading Type	0x01	Threshold

Table 3-7 +3.3VCC Sensor (continued)

Feature	Raw Value	Description
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x04	Volts
Nominal Reading	0xBF	3.3
Upper non-recoverable threshold	0xD6	3.7
Upper critical threshold	0xD1	3.62
Upper non-critical threshold	0xCC	3.53
Lower non-recoverable threshold	0xA8	2.91
Lower critical threshold	0xAD	2.99
Lower non-critical threshold	0xB1	3.06
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-8 +3.3VSB Sensor

Feature	Raw Value	Description
Sensor Name	+3.3VSB	-
Sensor LUN	0x00	-
Sensor Number	0x09	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x02	Voltage
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x04	Volts

Table 3-8 +3.3VSB Sensor (continued)

Feature	Raw Value	Description
Nominal Reading	0xC2	3.3
Upper non-recoverable threshold	0xD9	3.69
Upper critical threshold	0xD5	3.62
Upper non-critical threshold	0xD0	3.54
Lower non-recoverable threshold	0xAB	2.91
Lower critical threshold	0xB0	2.99
Lower non-critical threshold	0xB5	3.08
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-9 +5VCC Sensor

Feature	Raw Value	Description
Sensor Name	+5VCC	-
Sensor LUN	0x00	-
Sensor Number	0x08	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x02	Voltage
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x04	Volts
Nominal Reading	0xC3	4.99
Upper non-recoverable threshold	0xDB	5.61
Upper critical threshold	0xD6	5.48
Upper non-critical threshold	0xD1	5.35
Lower non-recoverable threshold	0xAC	4.4
Lower critical threshold	0xB1	4.53
Lower non-critical threshold	0xB6	4.66

Table 3-9 +5VCC Sensor (continued)

Feature	Raw Value	Description
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-10 +5VSB Sensor

Feature	Raw Value	Description
Sensor Name	+5VSB	-
Sensor LUN	0x00	-
Sensor Number	0x06	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x02	Voltage
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x04	Volts
Nominal Reading	0xC3	4.99
Upper non-recoverable threshold	0xDB	5.61
Upper critical threshold	0xD6	5.48
Upper non-critical threshold	0xD1	5.35
Lower non-recoverable threshold	0xAC	4.4
Lower critical threshold	0xB1	4.53
Lower non-critical threshold	0xB6	4.66
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-11 -48V Power1 Sensor

Feature	Raw Value	Description
Sensor Name	-48V Power1	-
Sensor LUN	0x00	-
Sensor Number	0x0C	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x08	Power Supply
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x03	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	Presence detected
-	Event Offset: 1	Power supply failure detected
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x03	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-12 -48V Power2 Sensor

Feature	Raw Value	Description
Sensor Name	-48V Power2	-
Sensor LUN	0x00	-
Sensor Number	0x0D	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x08	Power Supply
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x03	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	Presence detected
-	Event Offset: 1	Power supply failure detected

Table 3-12 -48V Power2 Sensor (continued)

Feature	Raw Value	Description
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x03	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-13 ACPI State Sensor

Feature	Raw Value	Description
Sensor Name	ACPI State	-
Sensor LUN	0x00	-
Sensor Number	0x16	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x22	System ACPI Power State
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x40	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 6	S4/S5 soft-off, particular S4/S5 state cannot be determined
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x40	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-14 BIOS Bank Sensor

Feature	Raw Value	Description
Sensor Name	BIOS Bank	-
Sensor LUN	0x00	-
Sensor Number	0x19	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0xD2	Emerson-specific Discrete Digital
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x0F	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Sensor Offset: 0	Last Boot from BIOS Bank A
-	Sensor Offset: 1	Last Boot from BIOS Bank B
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x0F	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-15 BMC POST ERROR Sensor

Feature	Raw Value	Description
Sensor Name	BMC POST ERROR	-
Sensor LUN	0x00	-
Sensor Number	0x1A	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x28	Management Subsystem Health
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x31	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	Sensor access degraded or unavailable
-	Event Offset: 4	Sensor failure

Table 3-15 BMC POST ERROR Sensor (continued)

Feature	Raw Value	Description
-	Event Offset: 5	FRU failure
Deassertion Event Mask(Byte 17)	0x31	-
Deassertion Event Mask(Byte 18)	0x00	-
Deassertion Events	-	-
-	Event Offset: 0	Sensor access degraded or unavailable
-	Event Offset: 4	Sensor failure
-	Event Offset: 5	FRU failure
Threshold Mask(Byte 19)	0x31	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-16 Boot Errors Sensor

Feature	Raw Value	Description
Sensor Name	Boot Errors	-
Sensor LUN	0x00	-
Sensor Number	0x10	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x1E	Boot Error
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x01	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	No bootable media
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x01	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified

Table 3-16 Boot Errors Sensor (continued)

Feature	Raw Value	Description
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	See IPMI 1.5 Specification, chapter "Sensor Type Codes and Data"

Table 3-17 CPU0 Core Rem Sensor

Feature	Raw Value	Description
Sensor Name	CPU0 Core Rem	-
Sensor LUN	0x00	-
Sensor Number	0x13	-
Entity ID	0x03	-
Sensor Type	0x01	Temperature
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x01	deg. C
Nominal Reading	0x1E	30
Upper non-recoverable threshold	0x65	101
Upper critical threshold	0x5E	94
Upper non-critical threshold	0x50	80
Lower non-recoverable threshold	0xE0	-32
Lower critical threshold	0xE5	-27
Lower non-critical threshold	0xEA	-22
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-18 CPU0 Status Sensor

Feature	Raw Value	Description
Sensor Name	CPU0 Status	-
Sensor LUN	0x00	-
Sensor Number	0x0E	-
Entity ID	0x03	-
Sensor Type	0x07	Processor
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x83	-
Assertion Event Mask(Byte 16)	0x01	-
Assertion Events	-	-
-	Event Offset: 0	Internal error (IERR)
-	Event Offset: 1	Thermal Trip
-	Event Offset: 7	Processor presence detected
-	Event Offset: 8	Processor disabled
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x83	-
Threshold Mask(Byte 20)	0x01	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-19 CPU1 Core Rem Sensor

Feature	Raw Value	Description
Sensor Name	CPU1 Core Rem	-
Sensor LUN	0x00	-
Sensor Number	0x14	-
Entity ID	0x03	-
Sensor Type	0x01	Temperature
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-

Table 3-19 CPU1 Core Rem Sensor (continued)

Feature	Raw Value	Description
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x01	deg. C
Nominal Reading	0x1E	30
Upper non-recoverable threshold	0x65	101
Upper critical threshold	0x5E	94
Upper non-critical threshold	0x50	80
Lower non-recoverable threshold	0xE0	-32
Lower critical threshold	0xE5	-27
Lower non-critical threshold	0xEA	-22
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-20 CPU1 Status Sensor

Feature	Raw Value	Description
Sensor Name	CPU1 Status	-
Sensor LUN	0x00	-
Sensor Number	0x0F	-
Entity ID	0x03	-
Sensor Type	0x07	Processor
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x83	-
Assertion Event Mask(Byte 16)	0x01	-
Assertion Events	-	-
-	Event Offset: 0	Internal error (IERR)
-	Event Offset: 1	Thermal Trip
-	Event Offset: 7	Processor presence detected
-	Event Offset: 8	Processor disabled
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x83	-

Table 3-20 CPU1 Status Sensor (continued)

Feature	Raw Value	Description
Threshold Mask(Byte 20)	0x01	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-21 CPU Inlet Temp Sensor

Feature	Raw Value	Description
Sensor Name	CPU Inlet Temp	-
Sensor LUN	0x00	-
Sensor Number	0x01	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x01	Temperature
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x01	deg. C
Nominal Reading	0x1E	30
Upper non-recoverable threshold	0x58	88
Upper critical threshold	0x44	68
Upper non-critical threshold	0x37	55
Lower non-recoverable threshold	0xF6	-10
Lower critical threshold	0xFB	-5
Lower non-critical threshold	0x05	5
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-22 FBD Inlet Temp Sensor

Feature	Raw Value	Description
Sensor Name	FBD Inlet Temp	-
Sensor LUN	0x00	-
Sensor Number	0x02	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x01	Temperature
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x01	deg. C
Nominal Reading	0x1E	30
Upper non-recoverable threshold	0x5F	95
Upper critical threshold	0x48	72
Upper non-critical threshold	0x3E	62
Lower non-recoverable threshold	0xF6	-10
Lower critical threshold	0xFB	-5
Lower non-critical threshold	0x05	5
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-23 FRU Hot Swap Sensor

Feature	Raw Value	Description
Sensor Name	FRU Hot Swap	-
Sensor LUN	0x00	-
Sensor Number	0x0A	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0xF0	PICMG 3.0: FRU HotSwap
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0xFF	-

Table 3-23 FRU Hot Swap Sensor (continued)

Feature	Raw Value	Description
Assertion Event Mask(Byte 16)	0x00	-
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0xFF	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	See PICMG 3.0 Specification, chapter "Reading the FRU Hot-Swap Sensor"

Table 3-24 FW Progress Sensor

Feature	Raw Value	Description
Sensor Name	FW Progress	-
Sensor LUN	0x00	-
Sensor Number	0x18	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x0F	System Firmware Progress
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x0F	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	System firmware error (POST Error)
-	Event Offset: 1	System firmware hang
-	Event Offset: 2	System firmware progress
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x0F	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified

Table 3-24 FW Progress Sensor (continued)

Feature	Raw Value	Description
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	See IPMI 1.5 Specification, chapter "Sensor Type Codes and Data"

Table 3-25 Handle State Sensor

Feature	Raw Value	Description
Sensor Name	Handle State	-
Sensor LUN	0x00	-
Sensor Number	0x11	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0xEB	OEM reserved
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x0F	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Sensor Offset: 0	Handle state ok (both in open/close state)
-	Sensor Offset: 1	Upper handle closed
-	Sensor Offset: 2	Lower handle closed
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x0F	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-26 HD Env Temp Sensor

Feature	Raw Value	Description
Sensor Name	HD Env Temp	-
Sensor LUN	0x00	-

Table 3-26 HD Env Temp Sensor (continued)

Feature	Raw Value	Description
Sensor Number	0x03	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x01	Temperature
Event/Reading Type	0x01	Threshold
Assertion Event Mask(Byte 15)	0x95	-
Assertion Event Mask(Byte 16)	0x0A	-
Deassertion Event Mask(Byte 17)	0x95	-
Deassertion Event Mask(Byte 18)	0x0A	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x3F	-
Base Unit	0x01	deg. C
Nominal Reading	0x1E	30
Upper non-recoverable threshold	0x5D	93
Upper critical threshold	0x4E	78
Upper non-critical threshold	0x3F	63
Lower non-recoverable threshold	0xF6	-10
Lower critical threshold	0xFB	-5
Lower non-critical threshold	0x05	5
Rearm mode	0x01	Auto
Hysteresis Support	0x02	Readable and Setable
Threshold Access Support	0x02	Readable and Setable
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	Analog reading byte	Analog sensor reading

Table 3-27 IPMB Link State Sensor

Feature	Raw Value	Description
Sensor Name	IPMB Link State	-
Sensor LUN	0x00	-
Sensor Number	0x0B	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0xF1	PICMG 3.0: IPMB Physical Link
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x0F	-
Assertion Event Mask(Byte 16)	0x00	-
Deassertion Event Mask(Byte 17)	0x00	-

Table 3-27 IPMB Link State Sensor (continued)

Feature	Raw Value	Description
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x0F	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	See PICMG 3.0 Specification, chapter"PhysicalIPMB-0Sensors"

Table 3-28 Log Disabled Sensor

Feature	Raw Value	Description
Sensor Name	Log Disabled	-
Sensor LUN	0x00	-
Sensor Number	0x15	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x10	Event Logging Disabled
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x3F	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	Correctable memory error logging disabled
-	Event Offset: 1	Event 'type' logging disabled.
-	Event Offset: 2	Log area reset/cleared
-	Event Offset: 3	All event logging disabled
-	Event Offset: 4	SEL Full.
-	Event Offset: 5	SEL almost full.
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x3F	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified

Table 3-28 Log Disabled Sensor (continued)

Feature	Raw Value	Description
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-29 PwrOk Sig. Drop Sensor

Feature	Raw Value	Description
Sensor Name	PwrOk Sig. Drop	-
Sensor LUN	0x00	-
Sensor Number	0x12	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x08	Power Supply
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x03	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	Presence detected
-	Event Offset: 1	Power supply failure detected
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x03	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-30 RTM Handle Sensor

Feature	Raw Value	Description
Sensor Name	RTM Handle	-
Sensor LUN	0x00	-
Sensor Number	0x30	-
Entity ID	0xC0	PICMG Rear Transition Module
Sensor Type	0xEB	OEM reserved

Table 3-30 RTM Handle Sensor (continued)

Feature	Raw Value	Description
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask (Byte 15)	0x0F	-
Assertion Event Mask (Byte 16)	0x00	-
Assertion Events	-	-
-	Sensor Offset: 0	Handle state ok (both in open/close state)
-	Sensor Offset: 1	Upper handle closed
-	Sensor Offset: 2	Lower handle closed
Deassertion Event Mask (Byte 17)	0x00	-
Deassertion Event Mask (Byte 18)	0x00	-
Threshold Mask (Byte 19)	0x0F	-
Threshold Mask (Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-31 RTM HS Sensor

Feature	Raw Value	Description
Sensor Name	RTM HS	-
Sensor LUN	0x00	-
Sensor Number	0x31	-
Entity ID	0xC0	PICMG Rear Transition Module
Sensor Type	0xF0	PICMG 3.0: FRU HotSwap
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask (Byte 15)	0xFF	-
Assertion Event Mask (Byte 16)	0x00	-
Deassertion Event Mask (Byte 17)	0x00	-
Deassertion Event Mask (Byte 18)	0x00	-
Threshold Mask (Byte 19)	0xFF	-
Threshold Mask (Byte 20)	0x00	-
Base Unit	0x00	(unspecified)

Table 3-31 RTM HS Sensor (continued)

Feature	Raw Value	Description
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	See PICMG 3.0 Specification, chapter "Reading the FRU Hot-Swap Sensor"

Table 3-32 SYSTEM RESTART Sensor

Feature	Raw Value	Description
Sensor Name	SYSTEM RESTART	-
Sensor LUN	0x00	-
Sensor Number	0x1B	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x1D	System Boot Initiated
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x80	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 7	System restart
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x80	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-33 Ver Change Sensor

Feature	Raw Value	Description
Sensor Name	Ver Change	-
Sensor LUN	0x00	-
Sensor Number	0x1C	-

Table 3-33 Ver Change Sensor (continued)

Feature	Raw Value	Description
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x2B	Version Change
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x81	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 7	Software or firmware change detected with associated entity was successful.
Deassertion Event Mask(Byte 17)	0x00	-
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x81	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	-

Table 3-34 Watchdog Sensor

Feature	Raw Value	Description
Sensor Name	Watchdog	-
Sensor LUN	0x00	-
Sensor Number	0x17	-
Entity ID	0xA0	PICMG Front Board
Sensor Type	0x23	Watchdog 2
Event/Reading Type	0x6F	Discrete (sensor-specific)
Assertion Event Mask(Byte 15)	0x0F	-
Assertion Event Mask(Byte 16)	0x00	-
Assertion Events	-	-
-	Event Offset: 0	Timer expired, status only (no action, no interrupt)
-	Event Offset: 1	Hard reset
-	Event Offset: 2	Power down
-	Event Offset: 3	Power cycle
Deassertion Event Mask(Byte 17)	0x00	-

Table 3-34 Watchdog Sensor (continued)

Feature	Raw Value	Description
Deassertion Event Mask(Byte 18)	0x00	-
Threshold Mask(Byte 19)	0x0F	-
Threshold Mask(Byte 20)	0x00	-
Base Unit	0x00	(unspecified)
Rearm mode	0x01	Auto
Hysteresis Support	0x00	No Hysteresis or unspecified
Threshold Access Support	0x00	No Thresholds
Event Message Control	0x00	Per Threshold / Discrete State
Reading Definition	-	See IPMI 1.5 Specification

SOL Module Configuration

4

4.1 Introduction

This chapter includes the following sections:

- Configure the SOL
- Enable SOL load
- Setup a SOL session
- Query the configuration of SOL
- Configure the SOL mode in OS

4.2 Configure the SOL

Before the configuration, the IPMC has no user or IP address, so you cannot connect to the IPMC through IPMITOOL. In this case, you need to use IPMI commands through the IPMB channel of the shelf managers to configure the SOL and set the IPMC.

The IPMB address is the hardware address marked on the shelf multiplied by 2.

Configuring SOL

Perform the following six steps to configure the SOL:

1. Set the IP addresses of the two channels.
   Use the command Set LAN Configuration Parameters of IPMI2.0 with Parameter selector of 3.
   See table 23-2 in section 23.1 of the IPMI 2.0 specification.
   The value of Parameter selector is 3.
   For example, on Emerson shelf manager, set the IP address of channel 1 to 172.17.10.78 and that of channel 2 to 172.18.10.78.
   ipmicmd -k "0 90 0 0c 01 01 03 ac 11 0a 4e" smi 0
   ipmicmd -k "0 90 0 0c 01 02 03 ac 12 0a 4e" smi 0

"90" is the IPMB address of the blade.

NOTICE

The IP addresses of the two channels cannot be set to be in the same network segment. Otherwise, the settings fail.

2. Set the subnet mask of the two channels.
   Use the command Set LAN Configuration Parameters of IPMI2.0 with Parameter selector of 6.
   The value of Parameter selector is 6.
   See table 23-4 in section 23.2 of the IPMI 2.0 specification.
   For example, on Emerson shelf manager, set the subnet masks of both channel 1 and channel 2 to 255.255.0.0.
   ipmicmd -k "0 90 0 0c 01 01 06 ff ff 00 00" smi 0
   ipmicmd -k "0 90 0 0c 01 02 06 ff ff 00 00" smi 0
   "90" is the IPMB address of the blade.

3. Set the user name.
   Use the command Set User Name of IPMI2.0.
   See table 23-32 in section 23.28 of the IPMI 2.0 specification.
   For example, on Emerson shelf manager, set the user name to solusername.
   ipmicmd -k "0 90 0 06 45 02 73 6f 6c 75 73 65 72 6e 61 6d 65" smi 0

4. Set the password.
   Use the command Set User Password of IPMI2.0.
   See table 23-34 in section 23.30 of the IPMI 2.0 specification.
   For example, on Emerson shelf manager, set the password to soluserpassword.
   ipmicmd -k "0 90 0 06 47 82 02 73 6f 6c 75 73 65 72 70 61 73 73 77 6f 72 64" smi 0

5. Set the user right.
   Use the command Set User Access Command of IPMI2.0.
   For example, on Emerson shelf manager, set the right of user 2 to Administrator (4).
   ipmicmd -k "0 90 0 06 43 f1 02 04 00" smi 0

6. Enable the user.
   Use the command Set User Password Command of IPMI2.0.
   For example, on Emerson shelf manager, enable user 2.
   ipmicmd -k "0 90 0 06 47 82 01" smi 0

4.3 Enable SOL Load

Use the command Set SOL Configuration Parameters of IPMI2.0. The value of Parameter selector is 1.

See table 26-3 in section 26.2 of the IPMI 2.0 specification.

The value of Parameter selector is 1.

See table 26-5 in section 26.3 of the IPMI 2.0 specification.

On Emerson shelf manager, enable the SOL of channel 1.

ipmicmd -k "0 90 0 0c 21 01 01 01" smi 0

4.4 Setup SOL Session

After the previous seven steps, you can set up a session or an SOL connection to the IPMC through IPMITOOL. You can use the commands provided by IPMITOOL to directly configure the SOL for the IPMC.

If a shelf manager supports automatic configuration through the script, you can use the script to configure the SOL directly. For example, in the command line of Emerson shelf manager, run the commands sv_stop and sv_start to restart the script and configure the SOL automatically. After that, you can use the SOL without configuring and modifying it.

4.5 Query the Configuration of SOL

Querying the configuration of SOL

To query the configurations, do the following:

1. Query the IP address.
   Use the command Get LAN Configuration Parameters.
   See table 23-3 in section 23.2 of the IPMI 2.0 specification.
   The value of Parameter selector is 3.
   For example, on Emerson shelf manager, query the IP address of channel 1.
   ipmicmd -k "0 90 0 0c 02 01 03 00 00" smi 0
   "90" is the IPMB address of the blade.

2. Query the subnet mask.
   Use the command Get LAN Configuration Parameters.
   The value of Parameter selector is 6.
   For example, on Emerson shelf manager, query the subnet mask of channel 1.
   ipmicmd -k "0 90 0 0c 02 01 06 00 00" smi 0

3. Query the user name.
   Use the command Get User Name.
   See table 22-33 in section 22.29 of the IPMI 2.0 specification.
   For example, on Emerson shelf manager, query the name of the user 2.
   ipmicmd -k "0 90 0 06 46 02 " smi 0

4. Query the channel information.
   Use the command Get Channel Access.

See table 22-27 in section 22.23 of the IPMI 2.0 specification.
For example, on Emerson shelf manager, query the information about channel 1.
ipmicmd -k "0 90 0 06 41 01 40" smi 0

5. Query the user right.
Use the command Get User Access.
See table 22-31 in section 22.27 of the IPMI 2.0 specification.
For example, on Emerson shelf manager, query the right of user 2 in channel 1.
ipmicmd -k "0 90 0 06 44 01 02" smi 0

If a session can be set up between the IPMITOOL and IPMC, you can query the information through IPMITOOL. For example, query network configuration information.

[b50611@localhost ~]$ ipmitool -I lanplus -L administrator -H 172.17.100.80 -U

solusername -P soluserpassword lan print

Set in Progress : Set Complete

IP Address Source : Static Address

IP Address : 172.17.100.80

Subnet Mask : 255.255.0.0

MAC Address : 00:12:13:14:15:15

SNMP Community String : public

IP Header : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10

IPMC ARP Control : ARP Responses Enabled, Gratuitous ARP Enabled

Gratituous ARP Intrvl : 2.0 seconds

Default Gateway IP : 172.17.166.55

RMCP+ Cipher Suites :

Cipher Suite Priv Max : uuuaXXXXXXXXXX

: X=Cipher Suite Unused

: c=CALLBACK

: u=USER

: o=OPERATOR

: a=ADMIN

: O=OEM

For details on how to query and set by IPMITOOL, refer to the documents related to IPMITOOL.

4.6 Configure the SOL Module in OS

All the configurations and the queries example above are carried out on the shelf manager of Emerson. If you want to do it in OS with standard IPMI tools by sending the IPMI command to the IPMC through KCS, some parameters of the command should be modified.

For example, we set the IP address of channel 1:

Emerson shelf manager:

ipmicmd -k "0 90 0 0c 01 01 03 ac 11 0a 4e" smi 0

Linux OS:

ipmicmd -k "f 0 0c 01 01 03 ac 11 0a 4e" smi 0

The identification section is different while the other parameters are the same, where "f" is the sending address of local KCS, "0" is the logic unit number.

Related Documentation

A

A.1 Emerson Network Power - Embedded Computing Documents

The Emerson Network Power - Embedded Computing publications listed below are referenced in this manual. You can obtain electronic copies of Emerson Network Power - Embedded Computing publications by contacting your local Emerson sales office. For documentation of final released (GA) products, you can also visit the following website: http://www.emersonnetworkpowerembeddedcomputing.com > Resource Center > Technical Documentation Search. This site provides the most up-to-date copies of Emerson Network Power - Embedded Computing product documentation.

Table A-1 Related Documentation

Document Title	Publication Number
ATCA-7150 Installation and Use	6806800E88
ATCA-7350 Installation and Use	6806800H59
RTM-ATCA-7350 Installation and Use	6806800H30
ATCA-7150: Control via IPMI Programmer's Reference	6806800E85
RTM-ATCA-7150 Installation and Use	6806800E87
ATCA-7X50-MEM Installation Information	6806800E27
ATCA-7X50-HDDx-SAS/SATA Installation Information	6806800E28
MEZC-RTM-7150-GE Installation Information	6806800F89
MEZC-RTM-7150-FC Installation Information	6806800F90

A.2 Related Specifications

For additional information, refer to the following table for related specifications. As an additional help, a source for the listed document is provided. Please note that, while these sources have been verified, the information is subject to change without notice.

Table A-2 Related Specifications

Item	Documentation
1	Intelligent Platform Management Interface Specification v1.5
2	Intelligent Platform Management Interface Specification Second Generation v2.0
3	PICMG 3.0 Revision 1.0 AdvancedTCA Base Specification